

### REMARKS

This application has been reviewed in light of the Office Action dated March 1, 2004. Claims 1-19 and 83 are pending in this application. Claim 20 has been cancelled, without prejudice or disclaimer or subject matter. Claims 1 and 83 have been amended to define still more clearly what Applicants regard as their invention. Claim 1 is in independent form. Favorable reconsideration is requested.

An Information Disclosure Statement and a corresponding Form PTO-1449 were filed on October 15, 1999 (a copy of the form PTO-1449 initialed by the Examiner is attached hereto). Applicants note that the Ihara, H., et al. reference was not initialed by the Examiner, thus Applicants respectfully request the Examiner to return an initialed copy of the Form PTO-1449, indicating that the Ihara, H., et al. reference was considered.

The Office Action rejected Claims 1-5, 7, 8, 17, and 20 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,721,422 (Bird); rejected Claims 10-16 and 18 under 35 U.S.C. § 103(a) as being unpatentable over Bird in view of U.S. Patent No. 5,955,753 (Takahashi); rejected Claim 19 under 35 U.S.C. § 103(a) as being unpatentable over Bird in view of U.S. Patent No. 6,021,172 (Fossum et al.); rejected Claim 83 under 35 U.S.C. § 103(a) as being unpatentable over Bird; and rejected Claims 6 and 9 under 35 U.S.C. § 103(a) as being unpatentable over Bird in view of U.S. Patent No. 5,442,396 (Nakashiba). Cancellation of Claim 20 renders its rejection moot. Applicants respectfully traverse these rejections.

The aspect of the present invention set forth in Claim 1 is an image sensing apparatus having a plurality of unit cells arranged in two dimensions, where each unit cell includes a plurality of photoelectric conversion elements and a common circuit shared by

and arranged between the plurality of photoelectric conversion elements included in the same unit cell that the common circuit belongs to. The common circuit processes signals from the plurality of photoelectric conversion elements and outputs the processed signals to an output line, arranged in either one or two dimensions. Moreover, a first distance between a center of mass of photo-receiving areas of adjoining photoelectric conversion elements included in a given unit cell is substantially equal to a second distance between the center of mass of the photo-receiving areas of the adjoining photoelectric conversion elements included in different unit cells at least in one direction, and a third distance between a center of mass of the photo-receiving area of a photoelectric conversion element included in the given unit cell and the center of mass of the photo-receiving area of the adjoining photoelectric conversion element included in an adjoining unit cell.

Among the notable features of Claim 1 are that the photoelectric conversion elements are designed such that the centers of mass of the photo-receiving areas of the photoelectric conversion elements are at uniform intervals within each unit cell and between unit cells when the common circuit occupies some area of each unit cell. The common circuit is arranged between the photoelectric conversion elements in each unit cell.

Applicants enclose "Attachment A", which is a figure that illustrates the relationship of the features of amended Claim 1, and, in particular, the relationship between the first to third distance recitations as used in Claim 1<sup>1</sup>. For example, the first distance is

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<sup>1/</sup>(It is to be understood, of course, that the scope of the claims is not limited to the details of this embodiment.)

depicted as ①, the second distance is depicted as ②, and the third distance is depicted as ③ in Attachment A. In addition, in amended Claim 1, Applicants defined more clearly the common circuit feature (shown on the Attachment as the “Common Area”). The common circuit, as shown in Attachment A, is arranged between a plurality of photoelectric conversion elements included in the same unit cell that the common circuit belongs to, processes the signals from the photoelectric conversion elements in the same unit cell, and outputs the processed signals to an output line. Support for this amendment can be found in as-filed Claim 20, which recited that the common circuit is a signal processing unit. In addition, Applicants note that Figures 2A, 2B, 21 and 22, and at least the description in the specification at page 19, lines 11-13; page 20, lines 1-5; page 44, lines 5-18; and page 45, lines 3-6, provide support for the changes to Claim 1.

Bird, as understood by Applicants, relates to electronic devices having an array with shared common conductors. According to Bird, any of vertical circuits 2, 3, 11 and horizontal circuits 1, 4, 21 do not actually process the signals from the photodiodes 87. More specifically, as seen in Figure 7, vertical circuits 2, 3 and horizontal circuits 1, 4, 21, are signal lines used for selecting the photodiodes 8 from which signals are read out (the horizontal circuit 1 is for selecting A pixels, circuit 2 for B pixels, circuit 3 for C pixels, circuit 4 for D pixels, and circuit 21 for selecting a row), and vertical circuit 11 is an output line for outputting the signals from photodiodes 8 to one of the amplifiers 78a~78d. The amplifiers 78a~78d are not arranged between the photodiodes 8. Applicants submit that nothing has been found in Bird that would teach or suggest a unit cell that includes a plurality of photoelectric conversion elements and a common circuit shared by the photoelectric conversion elements in the same unit cell, arranged between the photoelectric

conversion elements in the same unit cell, and arranged between the photoelectric conversion elements, as recited in Claim 1.

Moreover, in Bird, the centers of mass of the photodiodes 8 are not at uniform intervals. In contrast, according to an aspect of the invention set forth in Claim 1 (as shown in Attachment A) the centers of mass of the photo-receiving areas of the photoelectric conversion elements are at uniform intervals within each unit cell.

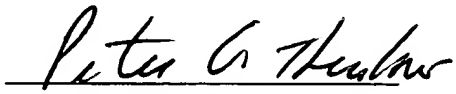
Accordingly, Applicants submit that at least for these reasons, Claim 1, and its dependent claims, are patentable over Bird, and respectfully request withdrawal of the rejection.

A review of the other art of record including Takahashi, Fossum et al., and Nakashiba, has failed to reveal anything that, in Applicants' opinion, would remedy the deficiencies of the art discussed above, as applied against the independent claims herein. Therefore, those claims are respectfully submitted to be patentable over the art of record.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and the allowance of the present application.

Applicants' undersigned attorney may be reached in our New York Office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address listed below.

Respectfully submitted,

  
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# ATTACHMENT A

